

The height of the Cylinder of Mercury, that, together with the Elater of the included Air, ballanced the pressure of the Atmosphere.	The Expansion of the Air.	The height of the Mercury that counterballanc'd the Atmosphere	The strength of the Elater of the expanded Air.
00	01	30	30
02	01 $\frac{1}{16}$	30	28
04	01 $\frac{1}{7}$	30	26
06	01 $\frac{2}{9}$	30	24
08	01 $\frac{1}{3}$	30	22
10	01 $\frac{1}{2}$	30	20
12	01 $\frac{3}{4}$	30	18
14	01 $\frac{5}{8}$	30	16
16	02 $\frac{1}{4}$	30	14
18	02 $\frac{1}{2}$	30	12
20	03	30	10
22	03 $\frac{1}{2}$	30	8
24	05 $\frac{1}{8}$	30	6
25	06 $\frac{1}{4}$	30	5
26	08 $\frac{1}{2}$	30	4
26 $\frac{1}{4}$	09 $\frac{1}{2}$	30	3 $\frac{1}{4}$
26 $\frac{1}{2}$	10 $\frac{1}{4}$	30	3 $\frac{1}{2}$
26 $\frac{3}{4}$	13	30	3 $\frac{1}{4}$
27	15 $\frac{1}{2}$	30	3

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I had several other Tables of my Observations, and Calculations, which I then made; but it being above a twelve month since I made them; and by that means having forgot many circumstances and particulars, I was resolved to make them over once again, which I did August the second 1661. with the very same Tube which I used the year before, when I first made the Experiment (for it being a very good one, I had carefully preserv'd it:.) And after having tryed it over and over again; and being not well satisfied of some particulars, I, at last, having put all things in very good order, and being as attentive, and observant, as possibly I could, of every circumstance requisite to be taken notice of, did register my several Observations in this following Table. In the making of which, I did not exactly follow the method that I had used at first; but, having lately heard of Mr. Townly's Hypothesis, I shap'd my course in such sort, as would be most convenient for the examination of that Hypothesis; the event of which you have in the latter part of the last Table.

The other Experiment was, to find what degrees of force were requisite to compress, or condense, the Air into such or such a bulk.

The manner of proceeding therein was this: I took a Tube about five foot long, one of whose ends was sealed up, and bended in the form of a Syphon, much like that represented in the fourth Figure of the 37. Scheme, one side whereof AD, that was open at A, was about fifty inches long, the other side BC, shut at B, was not much above seven inches long; then placing it exactly perpendicular, I pour'd in a little Quicksilver, and found that the Air BC was $6\frac{1}{2}$ inches, or very near to seven; then pouring in Quicksilver at the longer Tube, I continued filling of it till the Air in the shorter part of it was contracted into half the former dimensions, and found the height exactly nine and twenty inches; and by making several other tryals, in several other degrees of condensation of the Air, I found them exactly answer the former Hypothesis.

But having (by reason it was a good while since I first made) forgotten many particulars, and being much unsatisfied in others, I made the Experiment over again, and, from the several tryals, collected the former part of the following Table: Where in the row next the left hand 24. signifies the dimensions of the Air, sustaining only the pressure of the Atmosphere, which at that time was equal to a Cylinder of Mercury of nine and twenty inches: The next Figure above it (20) was the dimensions of the Air induring the first compression, made by a Cylinder of Mercury $5\frac{1}{2}$ high, to which the pressure of the Atmosphere nine and twenty inches being added, the elastick strength of the Air so compress'd will be found $34\frac{1}{16}$, &c.

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